What is the EAV Program Policy stated in NPD 8700.2?

- **EAV Program/Project Lead Center SMA Director:**
  - Assures SMA requirements are incorporated and implemented in contracts, memoranda of agreement, cooperative agreements, grants, other governing agreements or instruments, or other acquisition instruments used for developing or acquiring EAVs.
    - Objective Quality Evidence (OQE) – Contracts with SMA Requirements
  - Defines a Flight Readiness Review (FRR) process, which includes SMA flight certification, for each EAV flight or set of flights.
    - OQE – FRR Process
  - Ensures SMA and risk management requirements are defined and implemented for each test or operational scenario.
    - OQE – Documented SMA and Risk Management Requirements
  - Schedules and executes the reviews and surveillance to assure the SMA processes are in place and effective to enable SMA flight certification.
    - OQE – Project Plan and Schedule
- **EAV Program/Project Manager** ensures that applicable safety and mission success requirements defined in the Range Safety Requirements or the equivalent host range requirements documents, have been coordinated and implemented with the host range.
  - OQE – Documented Range Safety Requirements and Project Plan to Achieve these Requirements

☑ YOUR PREPAREDNESS FOR AN AUDIT OF NASA EAV SMA POLICY AND REQUIREMENTS WITH THESE SAMPLE AUDIT GUIDE QUESTIONS.

MANAGEMENT:

1. What Center reviews of the EAV program/project have been conducted and what reviews are scheduled? What are the results of the reviews conducted?
2. Where have you documented scenarios that minimize risk in off-nominal situations?
3. How has your program documented compliance to Range Requirements?
4. Does your program have any variances to the E_c requirements? If so, where are they documented and who has approved these variances?

GENERAL:

1. Where are your program's SMA and risk management requirements documented? How have you assured that the SMA requirements are implemented through the contract?
2. With what Range(s) are you working? And, who is/are the Range Official(s) with which your program is working?
3. Where are all permits, waivers, documents, or authorizations maintained for your program?

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NASA
SAFETY AND MISSION ASSURANCE REQUIREMENTS

NPD 8700.2 and NPR 8705.3

Experimental Aerospace Vehicles SMA Requirements

Compliance Verification Guide

OFFICE OF SAFETY AND MISSION ASSURANCE

This brochure is intended to be used as a guide only, not as a replacement for the actual policy. To review the Experimental Aerospace Vehicles SMA Requirements (NPD 8700.2 & 8705.3) in their entirety, see http://www.hq.nasa.gov/office/codeq/doctree/texttree.htm.

Why do we have a Safety and Mission Assurance (SMA) policy and requirements for Experimental Aerospace Vehicles (EAV)?

To limit the collective risks associated with EAV operation and ensure that the probability requirements are met for not doing harm to the public, astronauts, pilots, the workforce, high-value equipment and property.

Requirements in NPR 8705.3 are waived for aircraft operating in support of EAV missions at less than Mach 5 and less than 100,000 feet in altitude (normally covered by a suitable Airworthiness Review Process).

MINIMUM AUDIT POINTS FOR NPR 8705.3

Setting and Implementing Requirements

- **EAV Program / Project Manager**
  - Ensures that all elements of Table 2 in NPR 8705.3 have been addressed in a timely manner. (Table 2 lists SMA programmatic elements that are nominally applicable to the EAV program.)
    - OQE – Project Plan addressing Table 2 in NPR 8705.3 and Surveillance Record
  - Preplans for orbital, sub-orbital, and entry flight by developing detailed flight rules, procedures, and checklists prior to FRR (or equivalent), for both nominal and contingency operations.
    - OQE – Documented Flight Rules, Procedures and Checklists for Orbital, Sub-orbital, and Entry Flight
  - Addresses requirements of the ground environment as well as the flight environment.
    - OQE – EAV SMA Plan and EAV Ground Support Equipment
  - Assures that if human rating is a requirement of the EAV, and there are conflicts between NPR 8705.2, Human Rating Requirements for Space Systems, and the processes called out in NPR 8705.3, then NPR 8705.2 shall take precedence.
    - OQE – EAV SMA Plan and EAV Design
  - Documents scenarios that allow for continued safe flight and landing or flight termination in a manner that minimizes risk in off-nominal situations.
    - OQE – Documented Flight Plans and Range Reviews
  - Obtains all required permits, waivers, documents, or authorizations through the Center environmental offices to ensure that operations meet all Federal, state, or local environmental regulations.
    - OQE – Permits and Waivers
  - Assures that the Flight Termination System (FTS) security assessment is performed in accordance with applicable requirements.
    - OQE – Documented and Approved FTS Security Assessment
- **The EAV Operator** coordinates, develops procedures to support, and demonstrates prior to launch and reentry, the capability to notify maritime and aviation authorities with sufficient time to clear the trajectory, ground-track, and emergency abort areas of traffic.
  - OQE – Notification Procedures and Drills and Range Reviews
- The requirement for an FTS shall be determined by NASA with the cognizant range commander(s) for the range(s) on which the vehicle will perform its flight testing to ensure that the FTS is not susceptible to unauthorized or unwanted signals.
  - OQE – FTS documents and Range Reviews

Reviews and Surveillance

- **The Center SMA Organization** develops a SMA Surveillance Plan that shall be presented at the SMA Process Readiness Review (PRR).
  - OQE – SMA Surveillance Plan
- **Office of Safety and Mission Assurance** conducts a PRR early in the program/project life cycle to validate that the program/project SMA plan has established adequate processes to support granting of SMA Flight Assessment.
  - OQE – SMA Portion of the PRR
- **Center SMA Organization** maintains documentation of the surveillance, oversight, and independent assurance activities.
  - OQE – Surveillance Record
- **EAV Program / Project Manager** assures that launch safety, flight safety, and post flight processing safety are addressed as a part of the SMA Preflight Assessment Review (PAR).
  - OQE – SMA Portion of the PAR
- **The SMA Center** will present a summary of the mission assurance surveillance record at the SMA PAR.
  - OQE – SMA Surveillance Record Summary
- **The Chief Safety and Mission Assurance Officer** ensures that each flight or set of flights that the activities in paragraph 5.1 of NPR 8705.3 determined to be appropriate has been successfully completed and that all identified mission safety risks have been demonstrated by the program/project to be controlled to an acceptable level for flight.
  - OQE – Chief Safety and Mission Assurance Officer Signature on SMA Flight Assessment

Range Safety

- **The EAV Program / Project Manager**
  - Assures the EAV meets all local test range safety requirements.
    - OQE – Local Range Requirements
  - Addresses requests for variance to Casualty Expectation (E_c) requirements through the host range commander via the Chief Safety and Mission Assurance Officer.
    - OQE – Variances
  - Assures that for EAV flights, which are performed outside of established United States ranges, any ranges involved in the EAV flight shall be included in the process in this NPR.
    - OQE – EAV SMA Plan and Design
- **A Certified Range Safety Officer** will perform real-time hazard mitigation actions.
  - OQE – Communication Test Procedure, Range Safety Officer Certification Papers